REMARKS

The Examiner has rejected Claims 1, 4-8, and 11-26 under 35 U.S.C. 103(a) as being unpatentable over Johnson, U.S. Patent 6,469,704, in view of Deering, Michael F., and Nelson, Scott R., Leo: A System for Cost Effective 3D Shaded Graphics, in further view of Fowler, et al., U.S. Patent Application Publication US 2002/0180741. Applicant respectfully disagrees with such rejection.

With respect to all of the pending independent claims (with the exception of Claim 25), in the previously submitted Amendment A, applicant argued that the Examiner's Johnson-Deering combination would fail to meet applicant's specifically claimed "graphics floating point data [which] includes fragment data received from a rasterizer that is ... stored in an unclamped format" (emphasis added), where the "unclamped format [is] dictated by a graphics application program interface" (emphasis added).

Regarding such claim limitations, in his latest response, the Examiner argues that: (1) Applicant's discloses that OpenGL provides support for (and mandates) per-fragment operations; (2) Johnson discloses OpenGL, portions of the primitives, rendering; and (3) Fowler teaches congruity of these features.

It thus appears that the Examiner has relied on the foregoing excerpts to show applicant's claimed "fragment data" in the prior art.

With further respect to the foregoing claim limitations, the Examiner also indicates that Deering teaches applicant's claimed "graphics floating point data that is ... stored in an unclamped format...," in a manner similar to that argued previously.

Still yet, the Examiner now relies on Fowler to meet applicant's claimed "format [that is] dictated by a graphics application program interface" (emphasis

added). Specifically, the Examiner relies on Page 2, paragraphs 29-30, and 39 to make a prior art showing. See below.

> "[0029] Within a pixel pipeline, operations performed on the various values of a fragment may proceed along different datapaths and/or at different rates. In order to provide a larger and more detailed texture image, for example, texture maps are generally stored off-chip (e.g. in system memory), and as a consequence the storage access operation required to retrieve a texel value may have a latency of many processing cycles. In some implementations, a texture map may also be compressed for efficient storage and/or transfer, requiring a decompression operation (and resulting in an additional delay) upon retrieval. Such latencies may slow the rate of the texture datapath in relation to the datapaths of other fragment value operations.
>
> [0030] In order to synchronize the presentation of the various fragment values to the pixel combiner, it may be desirable to buffer one datapath to account for a delay in another datapath. FIG. 6 shows a block diagram of a 3D architecture having a pipeline 134 that includes a FIFO buffer 180 in a pass-through datapath. In an exemplary application, color and/or location values are carried on the pass-through datapath, and FIFO 180 compensates for latencies encountered in a texture datapath.
>
> [0039] One bump-mapping technique that is supported by the Direct3D and OpenGL APIs is environment-mapped bump mapping (EMBM). FIGS. 8A and 8B show how EMBM may be implemented in a serial fashion. In FIG. 8A, TL&F 150 uses a coordinate pair (e.g. in the ST texture coordinate space) to reference a specialized texture map called a `bump map ` (also called a `perturbation map,` `texture coordinate displacement map,` or simply `displacement map`). Instead of a texel value, the referenced map location contains a displacement vector (ds, dt) that TL&F 150 applies to perturb the coordinate pair (or, alternatively, another set of coordinate values) to obtain a new coordinate pair in another coordinate space (e.g. an S`T` environment coordinate space). For example, a TL&F operating in response to commands from a Direct3D API may apply a coordinate perturbation according to the following matrix equation: 1 [s ' t '] = [s t] + ([ds dt] x [M 00 M 01 M 10 M 11])"

The Examiner arguments, however, have significant deficiencies. For example, there is simply no mention in the foregoing except of any sort of "format," let alone a "format [that is] dictated by a graphics application program interface" (emphasis added). Fowler's Direct3D API matrix-based coordinate perturbation simply does not meet applicant's "format," as claimed.

To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art and not based on applicant's disclosure. *In re Vaeck*,947 F.2d 488, 20 USPQ2d 1438 (Fed.Cir.1991).

In view of the foregoing deficiencies, applicant contends that the third element of the *prima facie* case of obviousness. Specifically, the prior art references when combined fail to teach or suggest all the claim limitations embodied in the claim language: "graphics floating point data [which] includes fragment data received from a rasterizer that is ... stored in an unclamped format" (emphasis added), where the "unclamped format [is] dictated by a graphics application program interface" (emphasis added). Again, just by way of example, the Examiner has failed to make a prior art showing of applicant's claimed "format [that is] dictated by a graphics application program interface" (emphasis added).

Moreover, it appears that the Examiner has simply broken down applicant's claim language into components (i.e. phrases, adjectives, nouns, etc.), and has then attempted to make a prior art showing of such components in a vacuum. Thus, the Examiner's rejection may be considered analogous to gleaning phrases, adjectives, nouns, etc. from applicant's claims, and then using prior art references collectively as a dictionary to make a prior art showing of such phrases, adjectives, nouns, etc. The Examiner is reminded that a claim is anticipated only if each and every element as set forth in the claim is found, and the elements must be arranged as required by the claim. *In re Bond*, 910 F.2d 831, 15 USPQ2d 1566 (Fed. Cir. 1990). In view of the manner in which the Examiner has simply mapped phrases, adjectives, nouns, etc. of applicant's claims to the prior art, applicant asserts that the elements of the

Examiner's proposed combination are simply not arranged as required by applicant's claims.

With respect to the first element of the *prima facie* case of obviousness, the Examiner contends that there is suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. In view of the vast evidence to the contrary, applicant respectfully disagrees.

For example, Deering's vertex data processing *teaches away* from the *non-analogous* technique of storing fragment data received from a rasterizer in an unclamped format. Thus, only applicant teaches and claims the *unobvious* technique of fragment data processing in an unclamped format. The Examiner has not yet addressed applicant's previously submitted arguments regarding this issue.

As set forth in the originally filed specification, most computations dealing with fragment data are typically constrained to operate on values in the range [0,1]. Computational results are also typically clamped to the range [0,1]. Color, texture, and depth buffers themselves also hold values mapped to the range [0, 1]. Unfortunately, these constraints and the limited precision of typical computations can result in reduced accuracy during graphics processing. Only applicant teaches a combination of features for overcoming the foregoing problem.

With respect to independent Claim 25, applicant has amended such claim in independent form to include the exact limitations of the parent claim (Claim 19). Since Claim 25, by definition, already incorporated such limitations, applicant emphasizes that the present amendment would not require new search and/or consideration.

Applicant has previously emphasized that Claim 25 requires that "the buffer serves as a texture map by using previous rendering results via an extension of an application program interface," and requested a specific prior art showing of such

limitations or a notice of allowance. After carefully reviewing page 5 of the Examiner's action where Claim 25 is addressed, however, applicant can find no specific consideration of applicant's claimed "buffer [that] serves as a texture map by using previous rendering results via an extension of an application program interface." Thus, applicant contends that the third element of the *prima facie* case of obviousness has not been met with respect to Claim 25.

All of the independent claims are now deemed allowable along with any claims depending therefrom. An allowance of all pending claims is respectfully requested.

In the event a telephone conversation would expedite the prosecution of this application, the Examiner may reach the undersigned at (408) 505-5100. The Commissioner is authorized to charge any additional fees or credit any overpayment to Deposit Account No. 50-1351 (Order No. NVIDP069).

Respectfully submitted,

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